NEOTROPICAL BIOLOGY AND CONSERVATION

Neotropical Biology and Conservation 21(2): 111–122 (2026)
DOI: 10.3897/neotropical.21.e190757

Research Article

Lissocampsomeris bribri (Scoliidae, Scoliinae, Campsomerini), a new species from Panama

Luis Damián Ramírez-Guillén[1], Jorge L. León-Cortés[2], Armando Falcon-Brindis[3]

1 *Posgrado en Ciencias en Ecología y Desarrollo Sustentable, El Colegio de la Frontera Sur, Carretera Panamericana y Periférico Sur S/N C.P. 29290, San Cristóbal de las Casas, Chiapas, México*
2 *Departamento de Conservación de la Biodiversidad, El Colegio de la Frontera Sur, Carretera Panamericana y Periférico Sur S/N C.P. 29290, San Cristóbal de las Casas, Chiapas, México*
3 *Department of Entomology, Plant Pathology, and Nematology, University of Idaho, Parma Research and Extension Center, 29603 U of I Lane, Parma, Idaho 83660, USA*

Corresponding authors: Luis Damián Ramírez-Guillén (damianrg1993@gmail.com); Jorge L. León-Cortés (jleon@ecosur.mx); Armando Falcon-Brindis (afalconbrindis@uidaho.edu)

Abstract

A new species of Scoliidae, *Lissocampsomeris bribri* **sp. nov.** (Scoliinae, Campsomerini), is described from a single female found in Panama. We propose a taxonomic key to the females of *Lissocampsomeris*, including the new species. Additionally, images of *Lissocampsomeris columba* (Saussure, 1858) and *Lissocampsomeris wesmaeli* (Lepeletier, 1845) are provided for the first time. This finding increases the list of known Scoliidae in America to 72 species.

Key words: Campsomerina, mammoth wasps, taxonomic key, taxonomy

OPEN ACCESS

Academic editor: Patricia Nunes-Silva
Received: 10 March 2026
Accepted: 7 April 2026
Published: 23 April 2026

ZooBank: https://zoobank.org/62F9F7C8-B71D-4F7B-9587-1D0985D0DFA8

Citation: Ramírez-Guillén LD, León-Cortés JL, Falcon-Brindis A (2026) *Lissocampsomeris bribri* (Scoliidae, Scoliinae, Campsomerini), a new species from Panama. Neotropical Biology and Conservation 21(2): 111–122. https://doi.org/10.3897/neotropical.21.e190757

Copyright: © Luis Damián Ramírez-Guillén et al. This is an open access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0).

Introduction

The genus *Lissocampsomeris* is known to occur in the New World, comprising six valid species restricted to the Neotropical region: *L. argentea* (Haliday, 1837), *L. aureohirta* (Fox, 1896), *L. columba* (Saussure, 1858), *L. hoffmanseggii* (Klug, 1805), *L. idonea* (Bradley, 1945), and *L. wesmaeli* (Lepeletier, 1845) (Bradley 1957; Osten 2005; Taylor 2024). *Lissocampsomeris columba* is found from Costa Rica to Venezuela, *L. wesmaeli* occurs in Mexico (in the south), South America, and the Antilles (Trinidad and Tobago) (Fox 1896; Cameron 1893; Schrottky 1910; Bradley 1945; Finnamore and Hanson 1995; Fernandez and Cubillos 1999; Dos Santos et al. 2015). The remaining species typically occur in eastern South America (Brazil, French Guiana, Guyana, Paraguay, and Uruguay) (Fox 1896; Bradley 1945, 1974; Dos Santos et al. 2015). An exhaustive review of approximately 2,600 specimens of Scoliidae from Mexico and Central America was conducted, of which we examined 769 specimens of *Lissocampsomeris*. Nine specimens of *L. columba columba* (five females and four males), 642 of *L. columba albofimbriata* (117 females and 465 males), and 118 of *L. wesmaeli* (28 females and 90 males) were examined. We observed that a single female specimen (*Lissocampsomeris bribri* sp. nov.) differed morphologically from

L. columba and *L. wesmaeli* and did not match any of the known descriptions of the South American species. Here, we provide images of *L. columba* and *L. wesmaeli*, which remained unknown before this work. We therefore describe this new species collected in Panama. We also include a taxonomic key to females of *Lissocampsomeris* to facilitate future identification and new distribution records of *L. columba* and *L. wesmaeli*.

Materials and methods

The specimen used to describe the new species was obtained from the Museo de Invertebrados de la Universidad de Panamá (MIUP) in 2023. The examination of the specimens was conducted at El Colegio de la Frontera Sur, Unidad San Cristóbal, Colección Entomológica (ECO-SC-E).

The morphological terminology follows Huber and Sharkey (1993) and Taylor and Barthélémy (2021). The metasomal terga and sterna are abbreviated as *T* and *S*, respectively. Photos were taken with a Leica MC170HD camera attached to a Leica M250C stereoscope. Images were aligned using Leica Application Suite 4.9. Both the cleaning and correction processes were done in Adobe Photoshop version 22.4.3. ArcGIS 10.3 was used to build the distribution map. The taxonomic key was generated from the original descriptions, including synonyms (Klug 1805; Haliday 1837; Lepeletier de Saint-Fargeau 1845; Saussure 1858; Spinola 1853; Smith 1855, 1879; Cameron 1893; Fox 1896; Dalla Torre 1897; Bradley 1945; Osten 2005). The holotype is deposited at El Colegio de la Frontera Sur, Unidad San Cristóbal, Colección Entomológica (ECO-SC-E).

Results

The new records of *Lissocampsomeris columba columba*, *Lissocampsomeris columba albofimbriata*, and *Lissocampsomeris wesmaeli* were obtained from specimens deposited at the Universidad Nacional Autónoma de México, Instituto de Biología, Colección Nacional de Insectos (CNIN); Universidad del Valle de Guatemala, Centro de Estudios Ambientales y Biodiversidad, Colección de Artrópodos (CEAB-UVG); Universidad de San Carlos de Guatemala, Centro de Estudios Conservacionistas, Colección de Abejas Nativas de Guatemala (CANG); Colección de Artrópodos del Museo Nacional de Costa Rica (MNCR); Universidad de Costa Rica, Escuela de Biología, Museo de Zoología (MZUCR); and Universidad de Costa Rica, Escuela de Agronomía, Museo de Insectos (MIUCR). *L. c. columba* is recorded for the first time in Mexico and Guatemala. *L. c. albofimbriata* is recorded in all states of Costa Rica and is recorded for the first time in Bocas del Toro, Panama. *Lissocampsomeris wesmaeli* is recorded for the first time in Guatemala, and new records are added for the states of Oaxaca and Veracruz in Mexico (Table 1).

The new species is placed in the genus *Lissocampsomeris* due to the following characteristics proposed for the genus: posterior tibial spurs black and spatulate; posterior face of propodeum not coarsely and rugosely punctate; mesopleural ridge weak; lower plate of the mesopleura polished and almost or quite impunctate, the upper plate smooth (Bradley 1957).

Table 1. Checklist and distribution of *Lissocampsomeris* in America. *New distribution record.

Species of *Lissocampsomeris*	Distribution	Source
L. argentea (Haliday, 1837)	Brazil (Rio Grande do Sul and São Paulo) and Uruguay (Lavalleja and Montevideo)	Haliday 1837; Saussure 1858; Dalla Torre 1897; Bradley 1974
L. aureohirta (Fox, 1896)	Brazil (Mato Grosso do Sul) and Peru (Junin and Ucayali)	Fox 1896; Dos Santos et al. 2015
L. bribri Ramírez-Guillén, 2025, sp. nov.	Panama (Panama)	Found in this study.
L. columba columba (Saussure, 1858)	Colombia (Valle del Cauca), Venezuela (Distrito Capital), *Guatemala (Alta Verapaz, Baja Verapaz and Izabal) and *Mexico (Chiapas and Veracruz)	Saussure 1858; Dalla Torre 1897; Bradley 1945; Fernandez and Cubillos 1999).
L. columba albofimbriata (Smith, 1879)	Colombia, Costa Rica (*Alajuela, *Cartago, *Guanacaste, *Heredia, *Limon, *Puntarenas and *San Jose), Panama (*Bocas del Toro and Chiriqui)	Cameron 1893; Dalla Torre 1897; Bradley 1945; Finnamore and Hanson 1995
L. hoffmanseggii (Klug, 1805)	Brazil, French Guiana, Guyana and Paraguay	Klug 1805; Spinola 1853; Dalla Torre 1897; Bradley 1945
L. idonea (Bradley, 1945)	French Guiana (Cayena)	Bradley 1945
L. wesmaeli (Lepeletier, 1845)	Bolivia (East of Andes), Brazil (Mato Grosso do Sul), Colombia (Choco and Meta), Costa Rica (*Alajuela, *Cartago, *Guanacaste, *Heredia, *Limon *Puntarenas, and *San Jose), French Guiana, *Guatemala (Alta Verapaz), Guyana, Mexico (*Oaxaca and * Veracruz), Panama (*Chiriqui and Panama Oeste), Paraguay (Alto Parana), Peru (Cusco, Huanuco, Junin and Ucayali), Surinam, Trinidad and Tobago, and Venezuela (Apure, Anzoategui, Distrito Capital and Merida)	Spinola 1853; Smith 1855; Dalla Torre 1897; Fox 1896; Schrottky 1910; Bradley 1945; Finnamore and Hanson 1995; Fernandez and Cubillos 1999; Dos Santos et al. 2015).

Taxonomy

Family: Scoliidae Latreille, 1802
Subfamily: Scoliinae Latreille, 1802
Tribe: Campsomerini Bartlett, 1912
Subtribe: Campsomerina Bartlett, 1912
Genus: *Lissocampsomeris* Bradley, 1957

***Lissocampsomeris bribri* Ramírez-Guillén, sp. nov.**
https://zoobank.org/91C7ABDF-33BB-4A31-B2EC-7F9622DDBDD3
Figs 1A, B, 2A–C, 3A–D

Type material. Holotype: PANAMA • ♀; Panamá, Jardín Summit 29.xi.1994; N. Cigarruista leg.

Diagnosis. *Lissocampsomeris bribri* sp. nov. can be distinguished from other species of *Lissocampsomeris* by the following combination of characters in female individuals: dorsal area of propodeum with sparse punctures and without median projection on the posterior margin (Fig. 3C); posterior face of propodeum smooth, with a few punctures restricted to the lateral margins (Fig. 3D).

Female description. Length 20 mm

***Head*.** Clypeus smooth medially, with punctures present on the margins, those on the upper margin bearing long setae. Frons with dense punctures extending towards the ocular sinus. Ocular sinus with scattered punctures. Ocelli margins smooth with a few scattered punctures extending towards the middle of vertex. Vertex smooth towards the posterior side. Vertex, frons, ocular sinus with long sparse setae.

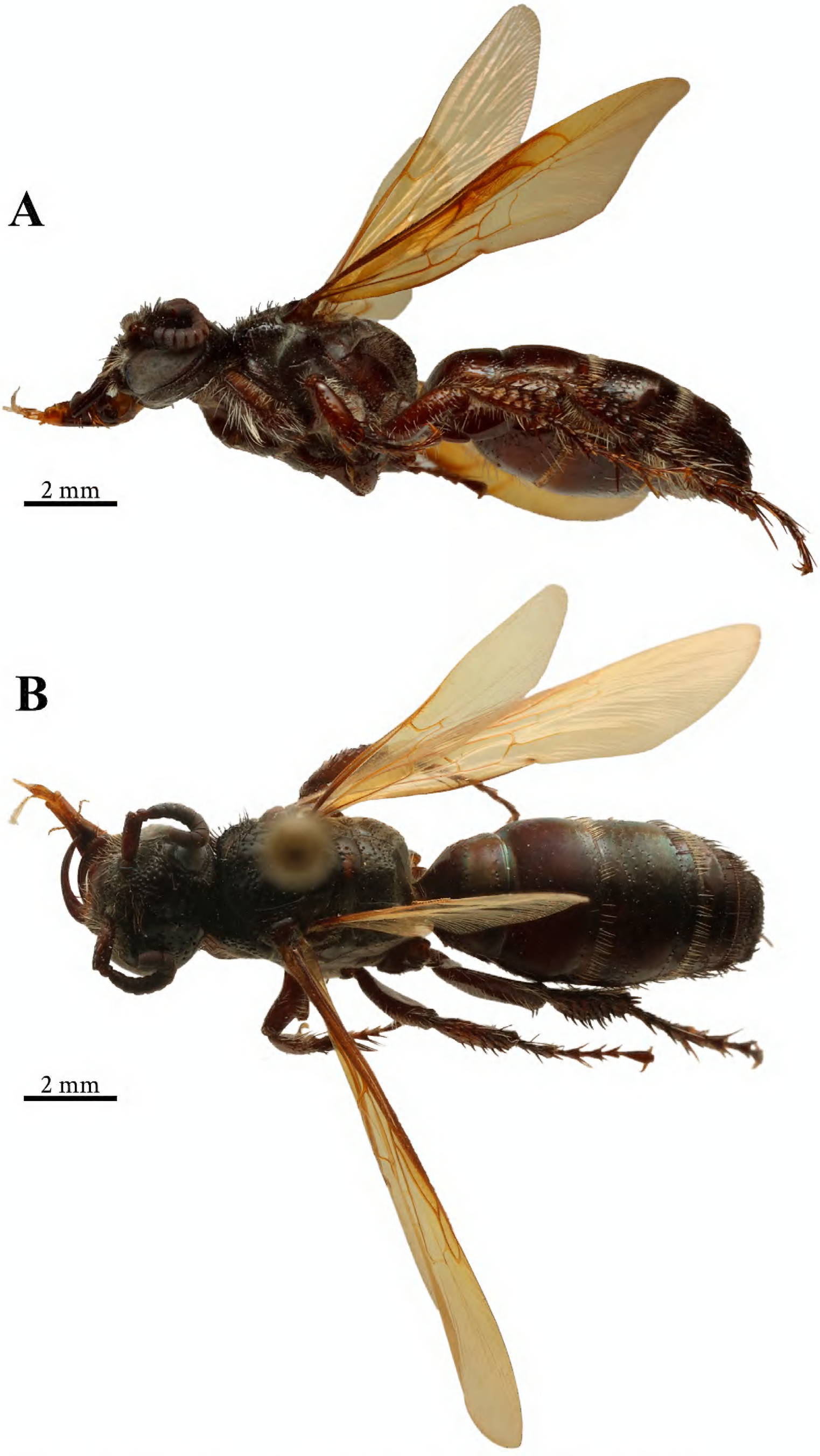

Figure 1. *Lissocampsomeris bribri* sp. nov., female, holotype. **A.** Lateral view; **B.** Dorsal view.

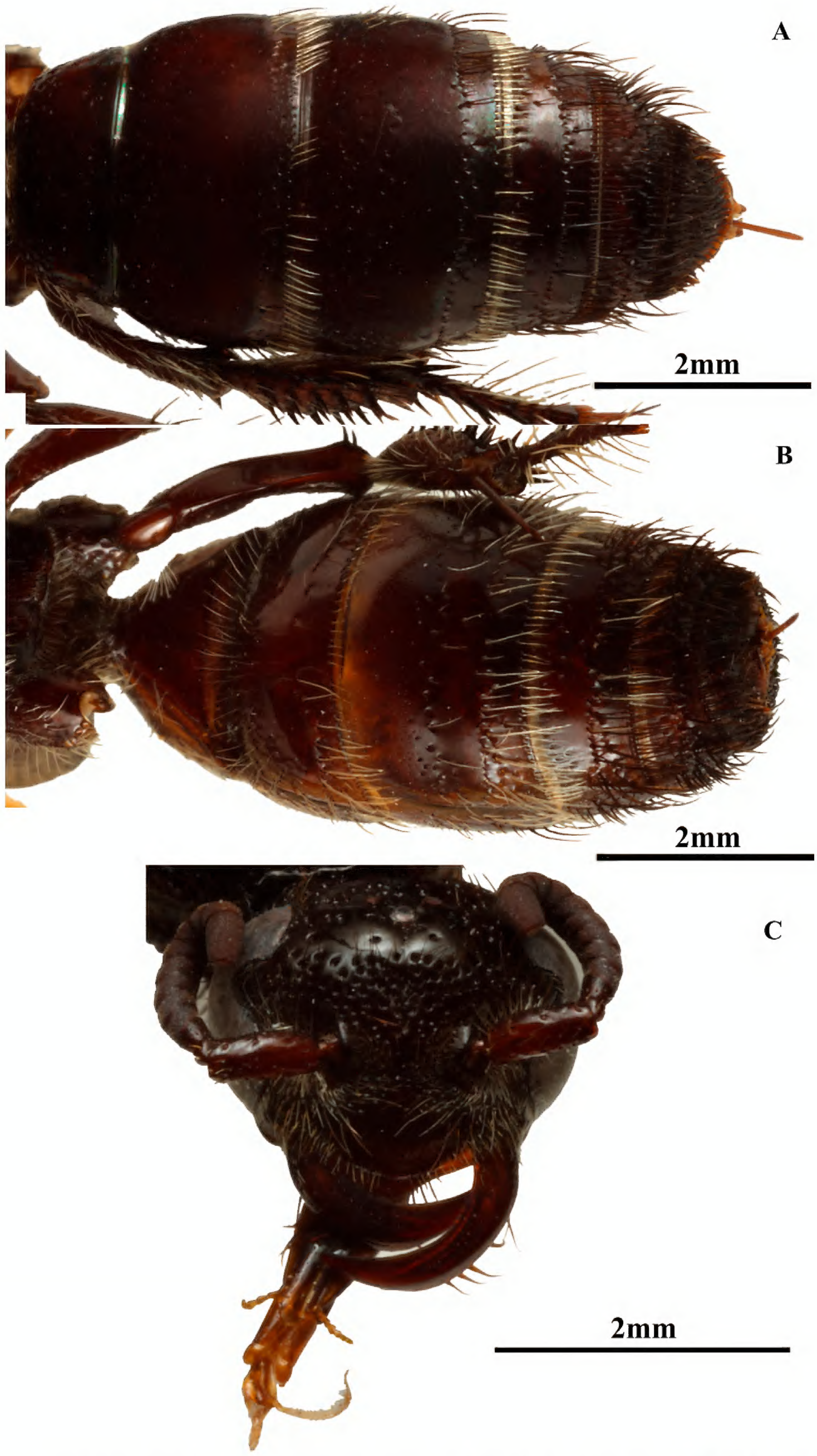

Figure 2. *Lissocampsomeris bribri* sp. nov., female, holotype. **A.** Metasoma, dorsal view; **B.** Metasoma, ventral view; **C.** Head, front view.

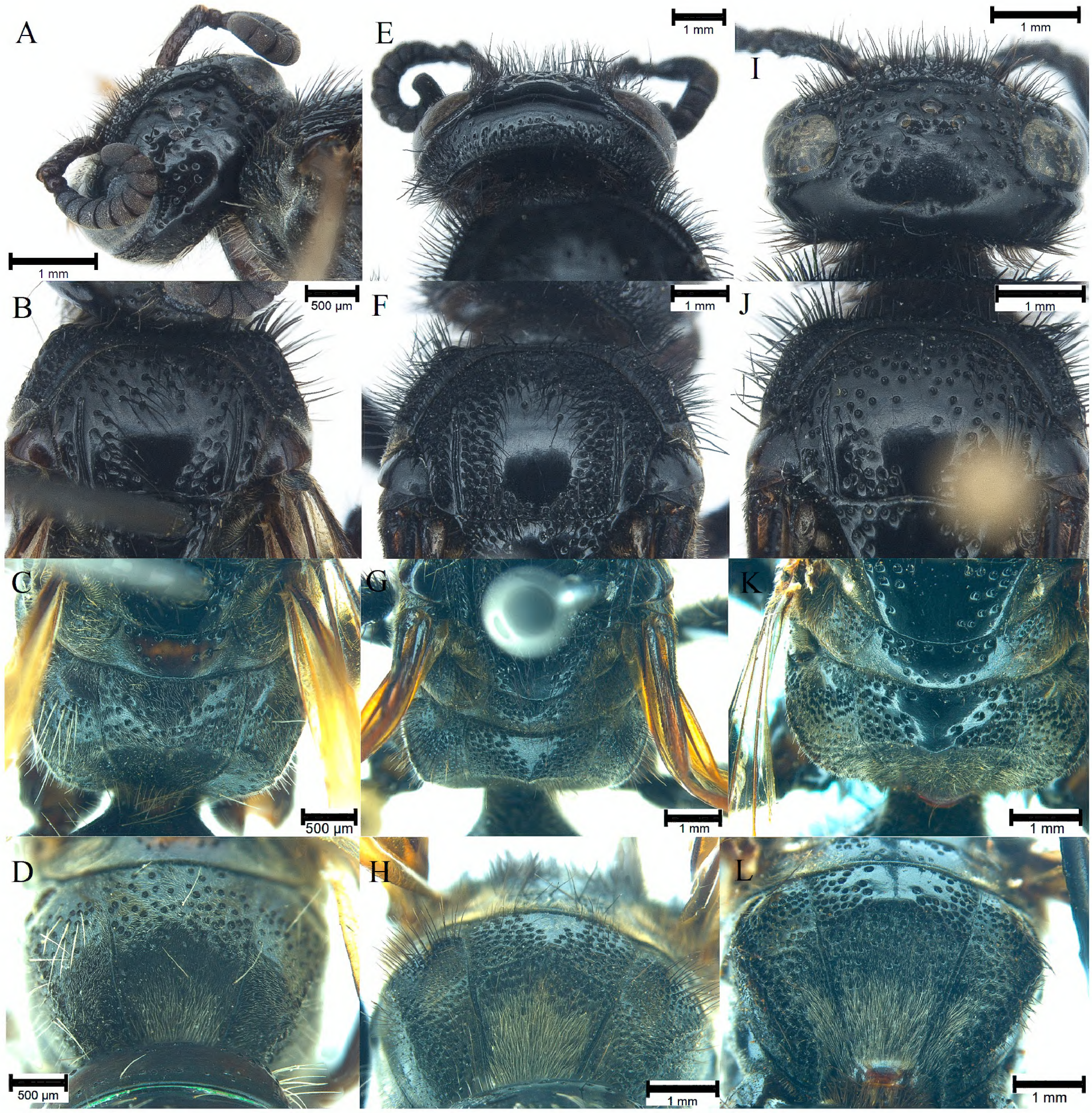

Figure 3. *Lissocampsomeris bribri* sp. nov., female, holotype. **A.** Vertex; **B.** Mesoscutum; **C.** Dorsal area of propodeum; **D.** Posterior area of propodeum. *L. columba*: **E.** Vertex; **F.** Mesoscutum; **G.** Dorsal area of propodeum; **H.** Posterior area of propodeum. *L. wesmaeli*: **I.** Vertex; **J.** Mesoscutum; **K**. Dorsal area of propodeum; **L.** Posterior area of propodeum.

***Mesosoma*.** Pronotum and scapula with coarse and dense punctures bearing long sparse setae. Mesoscutum smooth in the center, sparsely margins with punctures with sparce long setae. Scutellum and metanotum scarcely punctate with sparse long setae. Dorsal area of propodeum with scattered punctures and without median projection, posterior area smooth, with a few punctures on the lateral margins. Lateral area of propodeum with scattered punctures. Mesopleura and metapleural plates smooth. Metasternal plate without projections. Hind tibial spurs spatulate. Pronotum, mesoscutum, scutellum, metanotum, and lateral edge of dorsal area of propodeum extends to lateral area with sparse long setae. Tomentum present in the remaining mesosoma.

***Metasoma*.** T1–T2 punctures sparse near the anterior margin and T1–T2 with punctures forming a transversal row near posterior margin. T3 punctures sparse in anterior margin extend to the middle of T3, with punctures forming a transversal row near of the posterior margin. T4 punctures forming a transversal row near of anterior margin and another transversal row of puncture near posterior margin. T5 with scattered punctures. T6 densely punctuated. Setae emerge from all these punctures of terga. Posterior margins of T2–T6 with a row of setae except T1. S1 Smooth with lateral row setae. Lateral margin of S2 initiated three inclined rows of setae that extend to anterior margin and another transversal row of setae near posterior margin. S3 with tiny punctures in anterior margin extend to the middle of S3, a transversal row of setae in the middle of sternum and another near posterior margin. S4 with sparse punctures near the anterior margin and transversal row of setae near posterior margin. S5 with a transversal row of setae in the middle of sternum. S6 densely punctuated, covered with setae. Posterior margins of S2–S6 with a row of setae except S1. S2 without median tubercle. Pygidium rounded.

***Coloration*.** Integument black-brownish except for a faint yellow band on the metanotum. Vestiture of the pectus white. Pronotum, mesoscutum, T4–T6 with black setae, rest of the body with yellowish-white setae. Posterior spurs of legs black. Wings hyaline yellowish.

Etymology. The name is dedicated to Bribri, one of the seven native peoples of Panama. The Bribri live in northwest Panama in Bocas del Toro and in south-

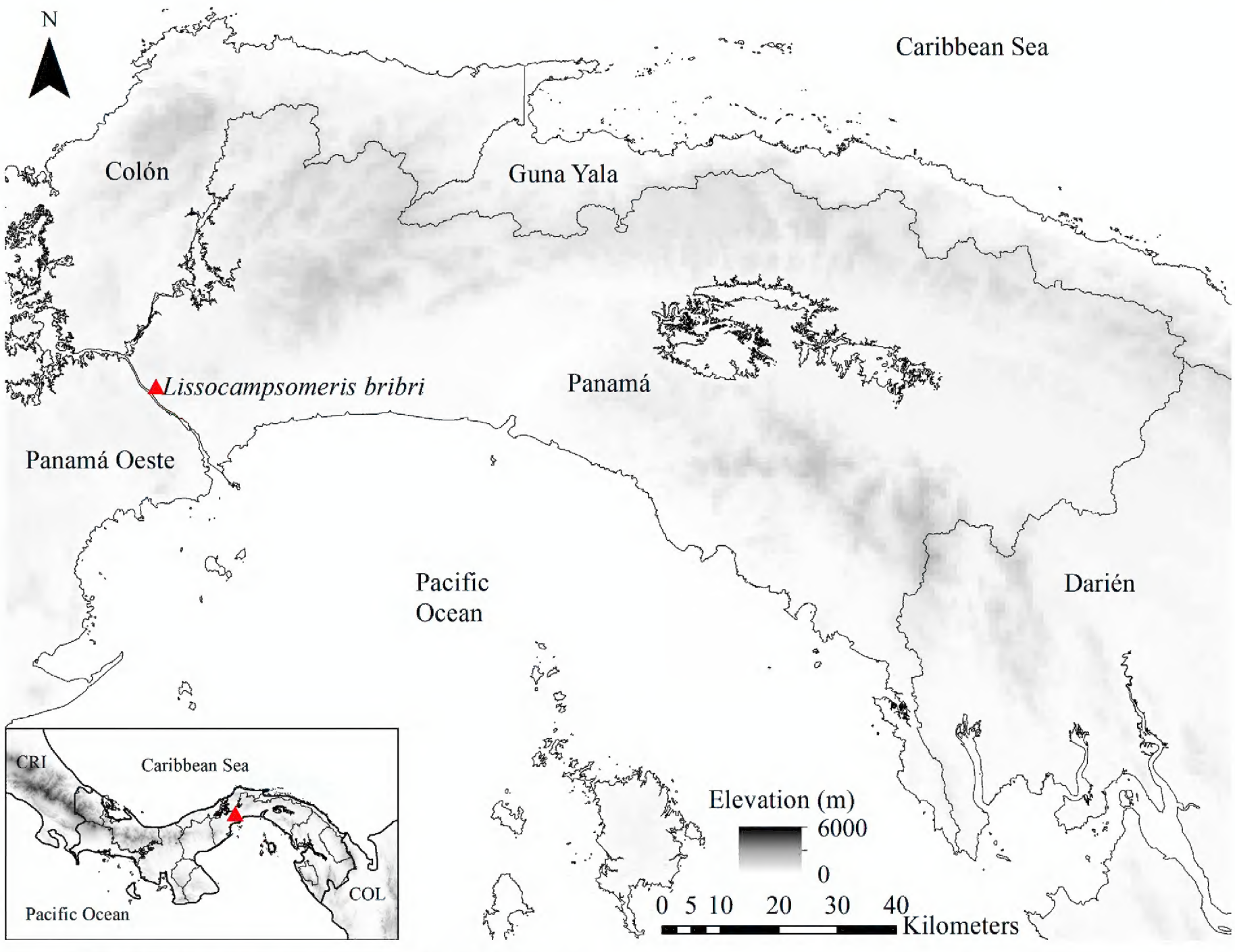

Figure 4. Distribution of *Lissocampsomeris bribri* sp. nov.

eastern Costa Rica (Puntarenas and Limón provinces). Treated as a non-Latin singular noun used in apposition.

Distribution. Panama: Panamá (Fig. 4).

Male. Unknown.

Taxonomic key to the females of *Lissocampsomeris*

1 Scutellum smooth **2**
– Scutellum punctuated **3**
2 Wings uniformly deep fusco-violaceous; T1–T3 with white-yellow spots ... ***L. hoffmanseggii***
– Wings hyaline; terga immaculate ..... ***L. argentea***
3 Occipital surface of vertex densely punctate above occipital carina (Fig. 3E) **6**
– Occipital surface of vertex impunctate to the occipital carina (Fig. 3A, I) ... **4**
4 Scutellum punctuated; wing hyaline **5**
– Scutellum with three punctures on each side; wings blue-black with strong reddish violaceous reflection ..... ***L. idonea***
5 Dorsal area of propodeum with punctures in the middle with V-shaped area smooth and with median projection (Fig. 3K); posterior area of propodeum with scattered punctures (Fig. 3L) ..... ***L. wesmaeli***
– Dorsal area of propodeum with separated punctures and without median projection (Fig. 3C); posterior area of propodeum smooth only with a few punctures on the lateral edges (Fig. 3D) ..... ***L. bribri* sp. nov.**
6 Dense fulvous pubescence on pronotum and mesoscutum .... ***L. aureohirta***
– Not dense pubescence and the color is black **7**
7 Wings hyaline or slightly yellow; tergites with black setae ..... ***L. columba columba***
– Wings strongly stained yellow; T1–T3 with white apical fringes ..... ***L. columba albofimbriata***

Discussion

This work updates the status of *Lissocampsomeris* and adds a new species to the genus, increasing the total to seven species for the genus in America. With this finding, and based on checklists and new species descriptions, the number of species in America increases to 72 (Osten 2005; Golfetti and Noll 2023a, 2023b; Szafranski 2023; Ramírez-Guillén et al. 2025). The description of this new species based on only one female specimen makes it difficult to understand the distribution, morphological variability, or dimorphism that this taxon may have; however, it is important to mention that some taxa have very few collected specimens.

We propose the first taxonomic key to all female species of *Lissocampsomeris*, and it will facilitate the identification of this group of wasps. Previous keys did not include all female species of *Lissocampsomeris* (Bradley 1945; Fernandez and Cubillos 1999). This key should be used with caution, as for *L. argentea*, *L. aureohirta*, *L. hoffmanseggii*, and *L. idonea*, only the original descriptions were reviewed, and those are limited. This may change once the South American species are addressed. The last description of *Lissocampsomeris* was

made in 1945 (Bradley 1945). We added new records for *Lissocampsomeris wesmaeli* (Guatemala) and *Lissocampsomeris columba columba* (Mexico and Guatemala) (Table 1). With this finding, the list of Scoliidae of Panama is increased to 13 species (Añino et al. 2024).

Upon reviewing the Scoliidae from Mexico and Central America, we observed that the only male specimen mentioned as *Pygodasis hyalina* (Saussure, 1864) in Ramírez-Guillén et al. (2022) is actually *Lissocampsomeris columba columba*, and the male specimen in Añino et al. (2024) is *L. columba albofimbriata*. This was confirmed after observing male and female specimens of *L. columba* from the same locality. When *Pygodasis hyalina* was mentioned in these works, knowledge was limited, and only a single taxonomic key for Neotropical species was available. *Pygodasis hyalina* is limited to Argentina, Brazil, and Colombia (Bradley 1945). Until now, *Pygodasis* is one of the more diverse genera, with 14 species. However, there are images for only two of the species, with no taxonomic keys, and a taxonomic review is required.

The species of *Lissocampsomeris* from Mexico and Central America can be separated by the following combination of characters: in *Lissocampsomeris columba*, the occipital surface of the vertex densely punctate above the occipital carina (Fig. 3E); the mesoscutum is densely punctate and smooth in the center (Fig. 3F); the anterior face of the propodeum with punctures in the middle, with a V-shaped area smooth and without a median projection (Fig. 3G); posterior face of the propodeum is punctate and smooth centrally (Fig. 3H). *Lissocampsomeris wesmaeli* occipital surface of vertex impunctate to the occipital carina (Fig. 3I), mesoscutum scattered punctate and smooth in the center (Fig. 3J), anterior face of propodeum with separated punctures in the middle, with V-shaped area smooth and with median projection (Fig. 3K), posterior face of propodeum punctate and smooth in the center (Fig. 3L). *Lissocampsomeris bribri* sp. nov. occipital surface of vertex impunctate to the occipital carina (Fig. 3A); mesoscutum smooth in the center, with scattered punctures on the margins (Fig. 3B); dorsal area of propodeum with sparse punctures and without a median projection on the posterior margin (Fig. 3C); posterior face of propodeum smooth, with a few punctures restricted to the lateral margins (Fig. 3D). It is important to note that *Lissocampsomeris wesmaeli* and *Lissocampsomeris bribri* sp. nov. share the puncture pattern in the vertex and mesoscutum, but they differ in the propodeum.

The family Scoliidae requires a thorough revision, especially in South and Central America. Recent taxonomic efforts are improving our understanding of Scoliidae, especially in Mexico, Brazil, and Panama. This is reflected in new records, distribution updates, taxonomic keys, and species descriptions (Añino et al. 2020, 2024; Ramírez-Guillén and Falcón-Brindis 2022; Ramírez-Guillén et al. 2022, 2025a, 2025b, 2025c; Szafranski 2023; Golfetti and Noll 2023a, 2023b; Golfetti et al. 2025; Castagnet et al. 2025). Further efforts are needed to collect and describe the male and to understand the distribution of *Lissocampsomeris bribri* sp. nov.

Acknowledgments

We thank Cristina Mayorga Martínez (CNIN), Natalia Escobedo (CANG), and Jiichiro Yoshimoto (CEAB-UVG) for facilitating access to their collections and for the time provided. We thank Yostin Añino (MIUP) for the donated specimen.

We thank León Esteban Ibarra Garibay for the photographs. The first author received a PhD scholarship (1024448) from SECIHTI during the development of this work and received equipment support from IDEAWILD (RAMIMEXI0525-01).

References

Añino YJ, Cambra RA, Windsor DM, Zuñiga R, Quintero D (2020) Review of *Scolia* (Hymenoptera: Scoliidae) from Central America, including seasonal flight activity in *Scolia guttata*. Acta Biológica Colombiana 25(2): 202–209. https://doi.org/10.15446/abc.v25n2.77590

Añino Y, Cambra RA, Díaz D, Gómez J, Ramos C, Hanson PE, Ramírez-Guillén LD (2024) New records and a comprehensive checklist of mammoth wasps (Hymenoptera, Scoliidae) in Panama. Neotropical Biology and Conservation 19(3): 361–366. https://doi.org/10.3897/neotropical.19.e127528

Bradley JC (1945) The Scoliidae (Hymenoptera) of Northern South America, with especial reference to Venezuela. -I. The genus *Campsomeris*. Boletin de Entomología Venezolana 4(1): 1–31.

Bradley JC (1957) The taxa of *Campsomeris* (Hymenoptera: Scoliidae) occurring in the New World. Transactions of the American Entomological Society 83(2): 65–77.

Bradley JC (1974) The types of the Scoliidae (Hymenoptera) described by Henri de Saussure or by Jules Sichel, or by them jointly. Revue Suisse de Zoologie 81(2): 417–485. https://doi.org/10.5962/bhl.part.76015

Castagnet J-B, Noll FB, Golfetti IF (2025) A revision of the genus *Aelocampsomeris* Bradley, 1957 (Hymenoptera: Scoliidae: Scoliinae). Revista Brasileira de Entomologia 69(2): 1–15. https://doi.org/10.1590/1806-9665-RBENT-2024-0137

Dalla Torre CG (1897) Catalogus Hymenoptorum hucusque descriptorum systematicus et synonymicus (Vol. VIII). Fossores (Sphegidae). Sumptibus Guilelmi Engelmann, Lipsiae, 749 pp. https://doi.org/10.5962/bhl.title.8794

Dos Santos EF, Grandinete YC, Noll FB (2015) Additions to the checklist of Scoliidae, Sphecidae, Pompilidae and Vespidae of Peru, with notes on the endemic status of some species (Hymenoptera, Aculeata). ZooKeys 519: 33–48. https://doi.org/10.3897/zookeys.519.6501

Cameron P (1893) Insecta. Hymenoptera (Fossores). In: Godman FD, Salvin O (Eds) Fam. Scoliidae (Vol. II). Biologia Centrali-Americana, London, 222–234.

Fernandez F, Cubillos W (1999) Las Avispas Escolidas (Hymenoptera: Scoliidae) de Colombia. In: Amat-G G, Andrade-C MG, Fernandez F (Eds) Insectos de Colombia (Vol. II). Academia Colombiana de Ciencias Exactas, Físicas y Naturales, Bogotá, 35–52.

Finnamore AT, Hanson PE (1995) 14.8 Scoliidae. In: Hanson PE, Gauld ID (Eds) The Hymenoptera of Costa Rica. Oxford University Press, 554–560. https://doi.org/10.1093/oso/9780198549055.003.0002

Fox WJ (1896) Contributions to a Knowledge of the Hymenoptera of Brazil. No. 1. Scoliidae. Proceedings of the Academy of Natural Sciences of Philadelphia 48: 292–307. https://doi.org/10.1126/science.3.68.607.c

Golfetti IF, Noll FB (2023a) After more than half a century: *Dielis diabo* (Hymenoptera: Scoliidae: Scoliinae), a new scoliid from the Neotropics. Zootaxa 231(3): 345–350. https://doi.org/10.11646/zootaxa.5231.3.10

Golfetti IF, Noll FB (2023b) *Stygocampsomeris manauara* (Hymenoptera: Scoliidae: Scoliinae), a new scoliid from the Amazon forest. Acta Amazonica 53: 351–355. https://doi.org/10.1590/1809-4392202300741

Golfetti IF, da Silva M, Dos Santos EF, Noll FB (2025) Phylogenetic analysis and biogeography of *Scolia* (Hymenoptera, Scoliidae, Scoliinae): implications for the classification and origin of Scoliini. Cladistics 41(3): 304–320. https://doi.org/10.1111/cla.12612

Haliday A (1837) Description of Hymenoptera collected by Capt. King in the Survey of Straits of Magellan. Transactions of the Linnean Society of London 17: 316–331. https://doi.org/10.1111/j.1095-8339.1838.tb00170.x

Huber JT, Sharkey MJ (1993) Structure. In: Goulet H, Huber JT (Eds) Hymenoptera of the World: An Identification Guide to Families. Agriculture Canada, Ottawa, 13–59.

Klug J (1805) Versuch einer Berichtigung der Fabriciusschen Gattungen *Scolia* und *Thipia*. Beitrage zur Naturkunde 1: 8–40.

Lepeletier de Saint-Fargeau A (1845) Histoire Naturelle des Insects: Hymenopteres (Vol. 3). Paris, 646 pp. https://doi.org/10.5962/bhl.title.9005

Osten von T (2005) Checkliste der Dolchwespen der Welt (Insecta: Hymenoptera, Scoliidae). Bericht der Naturforschende Gesellschaft Augsburg 62: 1–62.

Ramírez-Guillén LD, Falcón-Brindis A (2022) First record of Gynandromorphy in *Dielis plumipes confluenta*. Southwestern Entomologist 47(2): 523–525. https://doi.org/10.3958/059.047.0230

Ramírez-Guillén LD, Falcon-Brindis A, Gómez B (2022) The Scoliidae wasps (Hymenoptera: Scolioidea) of Mexico: taxonomy and biogeography. Zootaxa 5214(1): 47–88. https://doi.org/10.11646/zootaxa.5214.1.2

Ramírez-Guillén LD, Falcon-Brindis A, León-Cortés JL (2025a) First record of Gynandromorphy in *Dielis tolteca* (Saussure 1857) (Hymenoptera: Scoliidae). Proceedings of the Entomological Society of Washington 127(2): 280–285.

Ramírez-Guillén LD, Falcon-Brindis A, León-Cortés JL (2025b) Scoliidae, una familia de avispas peculiar, poco conocida y diversa en México. Boletín de la Sociedad Científica Mexicana de Ecología 5(3): 70–77.

Ramírez-Guillén LD, León-Cortés JL, Falcon-Brindis A (2025c) Two new species of *Scolia* (Hymenoptera, Scoliidae) from Mexico and Panama. Neotropical Biology and Conservation 20(4): 295–308. https://doi.org/10.3897/neotropical.20.e166466

Saussure de H (1858) Description de diverses espéces nouvelles ou peu connues du genre *Scolia*. Annales de la Société entomologique de France 3(6): 193–249.

Schrottky von C (1910) Beitrag zur Kenntnis der Scoliidae und Elididae aus Argentinien und Paraguay. Deutsche entomologische Zeitschrift 195–203. https://doi.org/10.1002/mmnd.4801910212

Smith F (1855) Catalogue of the Hymenopterous Insects in the Collection of the British Museum Part III. Mutillidae and Pompilidae. Taylor and Francis, London, 206 pp.

Smith F (1879) Descriptions of New Species of Hymenoptera in the Collection of the British Museum. London, 240 pp. https://doi.org/10.1080/00222937308680696

Spinola M (1853) Compte rendu des Hyménoptéres inédits provenant du voyage entomologique de Mr. Ghiliani dans le Para en 1846. Memorie della Reale accademia delle scienze di Torino 13(2): 19–94.

Szafranski P (2023) New *Dielis* species and structural dichotomy of the mitochondrial cox2 gene in Scoliidae wasps. Scientific Reports 13(1950): 1–12. https://doi.org/10.1038/s41598-023-27806-x

Taylor C, Barthélémy C (2021) A review of the digger wasps (Insecta: Hymenoptera: Scoliidae) of Hong Kong, with description of one new species and a key to known species. European Journal of Taxonomy 786(1): 1–92. https://doi.org/10.5852/ejt.2021.786.1607

Taylor CK (2024) Annotated checklist of family-and genus-group names associated with Scoliidae (Hymenoptera, Aculeata). Journal of Hymenoptera Research 97: 945–1006. https://doi.org/10.3897/jhr.97.134123

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Artificial Intelligence (AI) use

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI.
No AI tools were used in the preparation of this manuscript.

Funding

No funding was reported.

Author contributions

All authors have contributed equally.

Author ORCIDs

L.D. Ramírez-Guillén https://orcid.org/0000-0003-2853-2714
J.L. León-Cortés https://orcid.org/0000-0003-1706-5620
A. Falcon-Brindis https://orcid.org/0000-0003-2496-2178

Data availability

All of the data that support the findings of this study are available in the main text.